WHAT IS CLAIMED IS:

1. A porous calcium phosphate ceramic body comprising a substrate, and three-dimensional nanotunnel layers formed on wall surfaces of said substrate and having pluralities of three-dimensionally connected nanotunnels.

2. The porous calcium phosphate ceramic body according to claim 1, wherein said three-dimensional nanotunnel layers have an average thickness of 20 nm to 10 μm.

3. The porous calcium phosphate ceramic body according to claim 1 or 2, wherein said substrate has fine pores, and said three-dimensional nanotunnel layers being formed on wall surfaces of said fine pores.

4. The porous calcium phosphate ceramic body according to claim 3, wherein said three-dimensional nanotunnel layers are formed on 5 to 100% of the wall surfaces of said fine pores.

5. The porous calcium phosphate ceramic body according to claim 3 or 4, wherein at least part of said nanotunnels have openings communicating with the fine pores of said substrate.

6. The porous calcium phosphate ceramic body according to claim 5, wherein said openings have an average diameter of 1 to 5000 nm.

7. The porous calcium phosphate ceramic body according to any one of claims 3 to 5, wherein said substrate has a porosity of 40 to 98%.

8. The porous calcium phosphate ceramic body according to any one of claims 1 to 7, wherein the atomic ratio of Ca/P in said three-dimensional nanotunnel layers is substantially equal to or smaller than that in said substrate.

9. A method for producing a porous calcium phosphate ceramic body having a three-dimensional nanotunnels layer, comprising the steps of immersing a calcium phosphate substrate in a slurry containing fine calcium phosphate particles, defoaming said slurry under reduced pressure,

and heat-treating the slurry-carrying substrate.

10. The method for producing a porous calcium phosphate ceramic body according to claim 9, wherein said fine calcium phosphate particles have an average diameter of 10 nm to 5 μm.

11. The method for producing a porous calcium phosphate ceramic body according to claim 10, wherein said fine calcium phosphate particles are as long as 10 to 200 nm in the c-axis and 1 to 100 nm in the a-axis, and have a specific surface area of 30 to 300 m^2/g.

12. The method for producing a porous calcium phosphate ceramic body according to claim 10 or 11, wherein said fine calcium phosphate particles are single crystals of calcium phosphate.

13. The method for producing a porous calcium phosphate ceramic body according to any one of claims 9 to 12, wherein said substrate is porous.

14. The method for producing a porous calcium phosphate ceramic body according to any one of claims 9 to 13, wherein said heat treatment is conducted at a temperature of 600 to 900°C.